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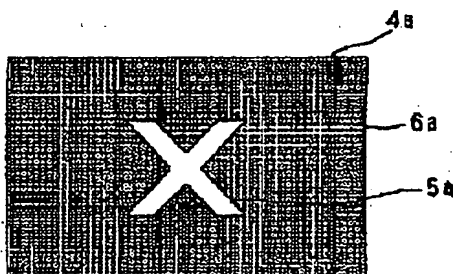
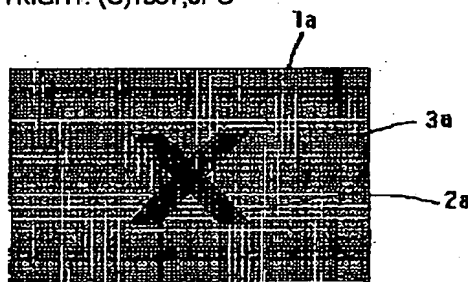
(54) **INK AND PRINTED MATTER FOR PREVENTING FORGERY**

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(57) Abstract

**PROBLEM TO BE SOLVED:** To discriminate easily the forgery utilizing a copier of high resolution by setting the component ratio of a coloring material and a pearl pigment contained in ink in the specified range.

**SOLUTION:** The component ratio of a pearl pigment coating a metal oxide which is transparent in a visible zone provided with refraction properties of 2.0 or more as the metal oxide providing reflection properties to a coloring material of a yellow component as the brightest color separation component contained in ink and mica is set in the range of 1:0.1 to 1:99. When a background section 3a and a latent image section 2a are printed by using ink having set the above-referred range, a copied matter 4a in which the latent image section 2a is decolored and the background section 3a is color changed is formed by copying by a color copier. Forgery utilizing the color copier of high resolution can be discriminated easily by the arrangement to prevent the forgery by the color copier.



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## CLAIMS

## [Claim(s)]

[Claim 1] Ink for forged prevention which is ink which contains colored coloring matter and a pearl pigment of arbitration at least, and is characterized by a component ratio (weight ratio) of said colored coloring matter and said pearl pigment being in the range of 1:0.1 thru/or 1:99.

[Claim 2] Said pearl pigment is ink for forged prevention according to claim 1 characterized by covering a refractive index with a metallic oxide in 1.6 or more microns, and using a pearl pigment with a larger refractive index of this metallic oxide than 2.0.

[Claim 3] Forged prevention printed matter according to claim 2 with which thickness of said metallic oxide which covers said mica is characterized by using a pearl pigment which is at least 200-2000Å.

[Claim 4] At least said metallic oxide which covers said mica Sb two S<sub>3</sub>, Fe 2O<sub>3</sub>, PbO, ZnSe, CdS and Bi 2O<sub>3</sub>, and TiO<sub>2</sub>, PbCl<sub>2</sub>, CeO<sub>2</sub>, Ta 2O<sub>5</sub>, ZnS, ZnO, CdO and Nd 2O<sub>3</sub>, Sb 2O<sub>3</sub>, and SiO and InO<sub>3</sub> from -- forged prevention printed matter according to claim 2 characterized by using a pearl pigment covered by two-layer [ which is chosen / of a monolayer / covering or two-layer ].

[Claim 5] It is the forged prevention printed matter characterized by being what a part of printing part [ at least ] is printed in ink for forged prevention more than an independent color or two or more colors, and said ink for forged prevention of is ink which contains colored coloring matter and a pearl pigment of arbitration at least, and has the component ratio (weight ratio) of said colored coloring matter and said pearl pigment in the range of 1:0.1 thru/or 1:99.

[Claim 6] Forged prevention printed matter according to claim 5 which is forged prevention printed matter which has the first printing field which consisted of coarse halftone dots, and the second printing field which consisted of fine halftone dots, and is characterized by printing the first printing field using said ink for forged prevention at least.

[Translation done.]

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## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] This invention relates to the printed matter printed using the ink which can prevent the copy forgery by the color copying machine, and this ink.

[0002]

[Description of the Prior Art] In recent years, the elaborate copy which is hard to distinguish from a genuine article is attained with development of a color copying machine, and forgery of the security by copy, a check, a bill, etc. is occurring. According to the skilled appraisal person, these copies and forged printed matter can be easily appraised as imitation, but there are also many sowings, such as a security, and opportunities to circulate mostly and broadly and for the man in the street deal with. Therefore, it is impossible to depend for distinction of truth, such as all securities, only on an expert, and what the man in the street can also judge easily is desired. There is technology using the difference of the resolution of the eyesight of the technology and human being who used the difference of human being's relative luminous efficiency and the spectral sensitivity of special coloring matter for what is known from the former as a method of making distinction of truth, such as such a security, easy, and the resolution of a copying machine. An example of printed matter which gave the forged preventive measure using the difference of human being's relative luminous efficiency and the spectral sensitivity of special coloring matter will be indicated by the patent application public notice No. 55062 official report in Showa 63. Moreover, an example of printed matter which gave the forged preventive measure using the difference of the resolution of human being's eyesight and the resolution of a copying machine has the Heisei 3 utility-model-application public notice No. 15338 official report, the Heisei 4 utility-model-application public notice No. 14220 official report, and the thing indicated by the utility model application public notice No. 20547 official report in Heisei 4.

[0003]

[Problem(s) to be Solved by the Invention] The Prior art using the difference of this human being's relative luminous efficiency and the spectral sensitivity of special coloring matter is the forged prevention technology in which the difference of human being's relative luminous efficiency and the sensitivity of a copying machine was used, and in order to prevent forgery by the copy of printed matter, the feature is in making a desired pattern form in the field where human being's relative luminous efficiency is weak using the special coloring matter which has a high spectral reflectance. For this reason, it was not able to become conditions to have a 450-650nm field, 450nm or less, or a reflection factor high to 650nm or more, and coloring matter applicable [ with this technology ] was able to use only limited coloring matter. Moreover, printing conditions become severe as the precision of the Prior art using the difference of the resolution of human being's eyesight and resolving of a copying machine of a copying machine improves, and satisfying operation is becoming difficult.

[0004] Then, the artificer of the invention in this application etc. developed the forged prevention printed matter which used the ink for forged prevention, and its ink for forged prevention previously (refer to the patent application public presentation No. 72662 official report in Heisei 7). This developed ink for forged prevention is ink containing the coloring matter (the second coloring matter) which has 30% or more of high reflection factor at least to the colored coloring matter (the

first coloring matter) and all the light fields of arbitration. The forged prevention printed matter characterized by the component ratio of the first coloring matter and the second coloring matter being in the range of 1:0.1 thru/or 1:99. Since the amount of reflected lights increases at the time of a copy, in the photo conductor of a color copying machine, a certain specific color-separation component of the three primary colors becomes is hard to be recognized in response to effect. It became the duplication which color reproduction was no longer faithfully performed, consequently was discolored compared with the original printed matter, and made it possible to distinguish forgery easily. Since trouble will be caused to the expression of the color tone of printed matter when the amount of the second coloring matter is made to increase although it is desirable for the difference and the decolorization effect of a color tone of thing and the duplication of printed matter to be large in order to make counterfeit distinction easy therefore, on the other hand, the demand which makes the amount of the second coloring matter increase, and the demand which reduces it may carry out an antimony to \*\* or \*\*. Since it is such, change of a color tone is remarkable between printed matter and its duplication, and development of the technology which can also enlarge the decolorization effect is desired.

[0005] This invention is accomplished in view of the situation like the above, and it aims at offering the forged prevention printed matter using the ink for forged prevention which can distinguish easily forgery using a copying machine with high resolution, and this ink for forged prevention.

[0006]

[Means for Solving the Problem] Corresponding to this purpose, ink for forged prevention of this invention is ink which contains colored coloring matter and a pearl pigment of arbitration at least, and is characterized by a component ratio (weight ratio) of said colored coloring matter and said pearl pigment being in the range of 1:0.1 thru/or 1:99.

[0007] Moreover, it is characterized by being what, as for forged prevention printed matter of this invention, a part of printing part [ at least ] is printed in ink for forged prevention more than an independent color or two or more colors, and said ink for forged prevention of is ink which contains colored coloring matter and a pearl pigment of arbitration at least, and has the component ratio (weight ratio) of said colored coloring matter and said pearl pigment in the range of 1:0.1 thru/or 1:99.

[0008]

[Embodiment of the Invention] The principle of a color copying machine applies light to the printed matter which is a manuscript. The reflected light Red (R), The color is separated with green (G) and three kinds of blue (B) color filters. Cyanogen (C), A Magenta (M) and the three-primary-colors component of yellow (Y) are extracted, Black (B1) is further added depending on each color toner corresponding to this three-primary-colors component, and the case, and color reproduction of color mixture is performed by the toner of four colors.

[0009] this invention -- a person -- etc. -- these -- a color copying machine -- setting -- a copy -- the time -- it can set -- a manuscript -- the reflected light -- an amount -- raising -- if -- being certain -- specification -- color separation -- a component -- it is -- for example -- yellow -- (= Y --) -- a component -- a part -- usual -- a color copying machine -- a photo conductor -- \*\*\*\* -- recognizing -- having -- hard -- becoming -- things -- finding out.

[0010] This invention uses this feature and uses the ink for forged prevention which specifically consists of the colored coloring matter (the first coloring matter) used in well-known colored ink, and the pearl pigment to which the amount of reflected lights at the time of a copy is made to increase. Since the amount of reflected lights increases the printed matter printed in this ink for forged prevention compared with the printed matter printed only by the colored coloring matter (the first coloring matter) which does not contain a pearl pigment at the time of a copy, the yellow (Y) which is a certain specific color-separation component of the three primary colors, for example, the brightest color-separation component, -- a component -- effect -- winning popularity -- the photo conductor of a color copying machine -- recognizing -- having -- being hard -- other cyanogen (C) and balance with a Magenta (M) collapse, and color reproduction is no longer performed faithfully. Consequently, it becomes the duplication colored the color tone from which the yellow (Y) component escaped compared with the original printed matter, and forgery can be distinguished easily. When printing especially printed matter in this ink for forged prevention and forming a

printing image by the specific halftone dot or the roughness and fineness of 10,000 lines, the decolorization effect can also be added besides the aforementioned discoloration and forgery can be distinguished further still more easily. Moreover, since the iris color is not in a duplication to presenting the dichroism of the color of a colored color material (the first color material), and an iris color (metallic luster color) according to an operation of the pearl pigment contained in the ink for forged prevention, the judgment of whether to be a duplication is easy for the printed matter itself. Moreover, since the specific color of an iris color can be made to emphasize by changing the thickness of metallic oxides, such as titanium oxide which has covered the mica which constitutes the pearl pigment in the ink for forged prevention, dichroism is emphasized by the printing lifter, and the difference in the color of printed matter and a duplication is expanded, and the judgment of a duplication becomes still easier.

[0011]

[Example] Hereafter, the details of this invention are explained while an example is shown.

[0012] The physical properties of the ink for forged prevention and presentation which are used by this invention are as follows. That is, it consists of colored coloring matter (the first coloring matter) and a pearl pigment at least. Colored coloring matter can accomplish the fundamental color of the ink for forged prevention of this invention, and can constitute it from following well-known color material according to each color. As a yellow pigment, an inorganic pigment and kino FUTARON systems, such as chrome yellow, cadmium yellow, and titan yellow, As organic pigments which generally belong to C.I. pigment yellow, such as an azo system and an iso indoline system, and red pigments An inorganic pigment and azo systems, such as cadmium red, a red oxide, and molybdate red, As organic pigments which generally belong to C.I. pigment red, such as the Quinacridone system, a perylene system, and Lake Red, and a purple pigment As organic pigments which generally belong to C.I. pigment violet, such as inorganic pigments, such as cobalt purple and manganese purple, and an oxazine system, an azo system, and an anthraquinone system, and a blue pigment An inorganic pigment and phthalocyanine systems, such as ultramarine blue, Berlin blue (Prussian blue), and cobalt blue, As organic pigments which generally belong to C.I. pigment blue, such as the Indanthrene system, an azo system, and an anthraquinone system, and green Organic pigments which generally belong to C.I. pigment green, such as inorganic pigments, such as chrome green and cobalt green, and a phthalocyanine system, can be used. Colored coloring matter adds and ink-izes a vehicle and an additive to such well-known color material, and uses them for them. Moreover, the coloring matter which has the color tone of arbitration, combining such color material two or more can also be prepared. In addition, the well-known color ink used by general printing, such as offset ink and rotogravure ink, can also be used as colored coloring matter.

[0013] Although the thing of any color tones can use colored coloring matter, the thing containing the yellow (Y) component which is brightest color-separation component is desirable. If many colors except some color generally separate the color into three primary colors, a yellow (Y) component is contained and can choose [ therefore ] the color tone of colored coloring matter from a large range. When such colored coloring matter is used, the yellow (Y) component when separating the color of colored coloring matter changes with existence of a pearl pigment quantitatively, consequently other cyanogen (C) and balance with a Magenta (M) component collapse, the duplication discolored compared with the original printed matter is obtained. According to an artificer's etc. experimental result, the discoloration effect of a green network was especially remarkable. Moreover, if the amount of reflected lights increases also about (Yellow Y) component cyanogen (C) and a Magenta (M) component by experiment, discoloring similarly in response to this effect is checked. Therefore, colored coloring matter can choose the thing of the color tone of arbitration.

[0014] If it uses since a pearl pigment makes the amount of reflected lights at the time of a copy increase, and it has 30% or more of high reflection factor to all light fields, the amount of reflected lights required at the time of a copy can be obtained. This pearl pigment is a pigment which has pearly luster, and it is the crystal of a carbonate, an arsenate system, etc., when light carries out incidence to this, it reflects multiply regularly, and pearly luster appears.

[0015] As a pearl pigment used for the invention in this application, as a metallic oxide which gives reflexivity (high iris reflex) to a mica, it is transparent to a visible region and is that with which refractility covered a certain metallic oxide 2.0 or more. For example, Sb two S3, Fe 2O3, PbO,



ZnSe, CdS, Bi<sub>2</sub>O<sub>3</sub>, TiO<sub>2</sub>, PbCl<sub>2</sub>, CeO<sub>2</sub>, Ta<sub>2</sub>O<sub>5</sub>, ZnS, ZnO, CdO and Nd<sub>2</sub>O<sub>3</sub>, Sb<sub>2</sub>O<sub>3</sub>, and SiO<sub>2</sub> and In<sub>2</sub>O<sub>3</sub>. It is formed by covering to two-layer [ of a monolayer / covering or two-layer ].

[0016] Since there are many amounts of reflection of the white light which carried out incidence and they start subrefraction from the difference of the refractive index being larger than 0.4 by the interface of a mica and a metal oxide film to coincidence when a mica and a metal oxide film are put together, it becomes high iris reflexivity and serves to promote the discoloration effect more effectively.

[0017] At this time, 10-10000Å, since the thickness of the range of 200-2000Å serves as high iris reflexivity to a visible region desirably, the thickness which can be used as a pearl pigment with the high rainbow reflexivity of the color tone of arbitration by controlling the thickness of the metal oxide film which covers a mica is desirable.

[0018] "Iriodin" (a trade name, product made from MIERCK) is one of things of marketing of such a pearl pigment. "Iriodin" is the stable inorganic pearl pigment which covered the surface of a natural mica with the metallic oxide of high refractive indexes, such as titanium oxide and an iron oxide, and the light reflected on the boundary with a mica with low layer of titanium oxide with a high refractive index and refractive index and surrounding data medium brings about pearly luster. This "Iriodin" can be made to emphasize a color [ \*\*\*\* / an iris color ] by changing the thickness of the covered titanium oxide. Such a pearl pigment is added, ink-izes a vehicle and an additive into mixture with colored coloring matter, and uses them for it. This is ink for forged prevention of the invention in this application.

[0019] 1% or more of the content of the pearl pigment in this ink for forged prevention is desirable at a weight ratio. If it is 1% or more, amount of reflected lights sufficient at the time of a copy can be obtained. The component ratio (weight ratio) of colored coloring matter and a pearl pigment is set to 1:0.1 thru/or 1:99, and 1:1 thru/or 1:20 are desirable in 1:9 thru/or 1:4, and the ink for offset in especially the ink for gravures. Since sufficient amount of reflected lights cannot be obtained if a pearl pigment is smaller than 0.1, change of the color tone at the time of a copy is small, and a check by looking of the change becomes difficult. Moreover, if a pearl pigment is larger than 99, since there are too many amounts of reflected lights, a desired color tone expression will become difficult and the quality of printing will be reduced to the printed matter itself. Although the ink for forged prevention can, in addition, produce colored coloring matter and a pearl pigment by the component ratio (weight ratio) described above, it can be dissolved in an organic solvent and can also produce what was added by the component ratio (weight ratio) which stated colored coloring matter and a pearl pigment to the synthetic resin as vehicles, such as polyvinyl chloride resin, polyvinylidene chloride resin, polyvinyl acetate resin, polyolefin resin, and polystyrene resin, above if needed.

[0020] The printing method using the ink for forged prevention can be printed using the well-known printing methods, such as gravure and offset printing, even if the pattern to print is the whole surface of printed matter -- a part -- you may be -- further -- thin -- the same effect can be acquired even if it is the pattern of a crest, a design, the crest, etc.

[0021] Moreover, if it prints to some printed matter using this ink for forged prevention and prints using the common color ink for printing of the same color network which does not contain a pearl pigment in other portions, only the part printed using the ink for forged prevention will discolor, and a duplication will become easier [ counterfeit discovery ].

[0022] Furthermore, two or more color preparation of the ink for forged prevention is changed and carried out for the color tone of colored coloring matter, and if a printing part is changed and printed, respectively, the duplication which has a completely different color tone from the original printed matter can be obtained.

[0023] Although all the things asked for copy prevention as printed matter are applicable, when an example is given, a check, a stock certificate, a gift certificate, a gift certificate, public lottery, a ticket, a commuter pass, a passbook, a credit card, an ID card, an ATM card, a prepaid card, etc. are contained.

[0024] (Example 1 of an experiment) The ink for forged prevention for gravures (A) which consists of the colored coloring matter (the first coloring matter) and the pearl pigment of the following presentation as an example was prepared.

[0025]

Colored coloring matter Microphone loris green GK (Ciba-Geigy Japan make) 1wt% Pearl pigment Iridin No.205 Iris color type (product made from MERCK) 11wt% Binder Polyester system resin (30% of pitches) Byron 20SS 58wt% (Toyobo Co., Ltd. make) organic solvent methyl-ethyl-ketone: -- toluene =1:1 30wt% -- when printed in this ink for forged prevention, the printed matter which has green and a dichroic golden color tone was able to be obtained.

[0026] (Result) Spectral-reflectance spectrum distribution a of this printed matter is as being shown in drawing 1. Although the reflection factor increased in the whole under the effect of a pearl pigment and printed matter wears white a little, it has the peak near 500nm and it is checked by appearance by looking that it is the printed matter of green and a dichroic golden color tone.

[0027] The color copying machine (CANON CLC500, alias name pixel Dio500, canon company make, trade name) copied this, and the duplication was created. The curve b in drawing 1 is the spectral-reflectance spectrum distribution of this duplication. It can judge that it is a duplication from spectral-reflectance spectrum distribution. In visual observation, printed matter is presenting the green metallurgy color with the angle to see, unlike printed matter, a duplication presents blue, and it does not reappear but that it is a duplication can distinguish a golden color tone easily also for appearance.

[0028] Next, forged prevention printed matter is explained. This forged prevention printed matter is what combined the forged prevention technology in which the previous ink for forged prevention was used, and the forged prevention technology in which the feature (it will grow fat if a coarse halftone dot is copied, and a fine halftone dot becomes thin on the contrary, and is not reproduced) of the repeatability of a copying machine was used. It has the advanced forged prevention effect that are the forged prevention printed matter which has two printing fields where the roughness and fineness of a halftone dot differ, and the decolorization effect is also acquired in addition to the discoloration effect by green, the dichroic golden color tone, and the copy of a copying machine. Drawing 1 b shows the location on the Lab color-coordinate-system solid of printed matter a and Duplication b.

[0029] That is, it is the forged prevention printed matter which has the first printing field which consisted of coarse halftone dots, and the second printing field which consisted of fine halftone dots, and the first printing field is printed using the previous ink for forged prevention at least. Since this forged prevention printed matter is taking such a configuration, and it discolors because the first printing field is using and printing the previous ink for forged prevention when a color copying machine copies, and it does not reappear by on the other hand the second printing field consisting of fine halftone dots but it decolorizes, that it is a duplication can distinguish at a glance.

[0030] They are forged prevention printed matter 1a from which drawing 2 (a) was obtained by the invention in this application, and duplication 4a which drawing 3 (b) copied this forged prevention printed matter with the color copying machine, and was obtained.

[0031] In drawing 2 (a), forged prevention printed matter 1a has background 3a which is two printing fields where the roughness and fineness of a halftone dot differ, i.e., the first printing field which consisted of coarse halftone dots, and latent-image section 2a which is the second printing field which consisted of fine halftone dots, and is printed using the ink for forged prevention of the invention in this application with same latent-image section 2a and background 3a. In this example, latent-image section 2a is formed as a warning mark X mark.

[0032] Thus, since latent-image section 2a of forged prevention printed matter 1a with green [ which was constituted ] and dichroic golden color tone a is printed using the same ink for forged prevention as background 3a, it is difficult to recognize existence of the warning mark X mark by latent-image section 2a, i.e., this example, only by glancing.

[0033] Since background 6a of duplication 4a is printed using the ink for forged prevention as shown in drawing 2 (b) if a color copying machine copies this forged prevention printed matter 1a and duplication 4a is created A golden color tone is not reproduced to background 3a of forged prevention printed matter 1a a, and it discolors blue, and on the other hand, since latent-image section 5a is constituted to the fine halftone dot, with a copying machine, it does not reappear, but it is decolorized and is visualized as a warning mark X mark of void.

[0034] Although background 3a which is the first printing field, and latent-image section 2a which is



the second printing field were printed in this example using the same ink for forged prevention. Even if it changes latent-image section 2a which is the second printing field to the usual printing ink which is not ink for forged prevention used by background 3a, if a color copying machine copies, latent-image section 2a can decolorize similarly, and duplication 4a which background 3a discolored can be obtained.

[0035] In this case, checking existence of latent-image section 2a which is the second printing field only by glancing at the usual printing ink used for printing of latent-image section 2a like a previous example when using what the ink for forged prevention used for printing of background 3a, the same color, or a hue approximated can obtain difficult forged prevention printed matter 1a.

[0036] Drawing 3 is the example of other forged prevention printed matter, and it is the duplication which drawing 3 (a) copied this forged prevention printed matter with forged prevention printed matter, copied drawing 3 (b) with the color copying machine, and was obtained.

[0037] In drawing 3 (a), forged prevention printed matter 1b has latent-image section 2b which are two printing fields where the roughness and fineness of a halftone dot differ, i.e., the first printing field which consisted of coarse halftone dots, and background 3b which is the second printing field which consisted of fine halftone dots, and is printed using the ink for forged prevention with same latent-image section 2b and background 3b. In this example, latent-image section 2b is formed as a warning mark X mark.

[0038] Thus, since latent-image section 2b of constituted forged prevention printed matter 1b is printed using the same ink for forged prevention as background 3b, it is difficult to recognize existence of the warning mark X mark with latent-image section 2b, i.e., this example, only by glancing.

[0039] If a color copying machine copies this forged prevention printed matter 1b and duplication 4b is created, since background 6 of duplication 4b b consists of fine halftone dots as shown in drawing 3 (b), it does not reappear in a copying machine but decolorizes, and on the other hand, latent-image section 5b will be visualized as a discolored warning mark X mark, in order to discolor to latent-image section 2b of forged prevention printed matter 1b.

[0040] Although latent-image section 2b which is the first printing field, and background 3b which is the second printing field were printed in this example using the same ink for forged prevention, even if it changes background 3b which is the second printing field to the usual printing ink which is not ink for forged prevention used with latent-image section 2b, if a color copying machine copies, background 3b can decolorize similarly, and duplication 4b which latent-image section 2b discolored can be obtained.

[0041] In this case, if what the ink for forged prevention and the same color which use for printing of latent-image section 2b the usual printing ink used for printing of background 3b, or a hue approximated is used, checking existence of latent-image section 2b which is the first printing field only by glancing like a previous example can obtain difficult forged prevention printed matter 1b.

[0042] Although the example by which the whole surface of forged prevention printed matter was constituted from drawing 2 and drawing 3 in the first printing field and the second printing field was shown. Since the same forged prevention effect can be acquired if the first printing field and the second printing field are in some forged prevention printed matter at least, other portions except the first printing field and the second printing field may be white grounds, or may perform other printings.

[0043] Moreover, if the first printing field and the second printing field are formed or incorporated as a part of printing pattern by the printing pattern which continues [ design ], respectively, it will further be hard coming to attach distinction of the first printing field and the second printing field, and the effect of being hard coming to recognize existence of the latent-image section with the naked eye will be acquired.

[0044] In the forged prevention printed matter shown in the example of drawing 2 and drawing 3, the combination which looks [ as a coarse halftone dot which constitutes the first printing field ] uniform in a naked eye from the range of 120 to 200 line and 5 - 46% of rates of halftone dot area as a fine halftone dot which constitutes the second printing field from a range of 50 to 100 line and 5 - 46% of rates of halftone dot area can be chosen.

[0045] For example, in the example of forged prevention printed matter 1a of drawing 2, if latent-

image section 2a which is the second printing field is constituted from 150 lines and 22 - 30% of rates of halftone dot area which are a fine halftone dot, latent-image section 2a will not be conspicuous, when background 3a which is the first printing field is constituted from 65 lines and 30% of rates of halftone dot area which are a coarse halftone dot for an exterior.

[0046] In addition, although distinction with latent-image section 2a, 2b, and Backgrounds 3a and 3b is clearly expressed on account of the plot in the forged prevention printed matter 1a and 1b shown in drawing 2 (a) and drawing 3 (a), distinction is able to print by human being's eyesight, so that it may be difficult in an actual printing lifter.

[0047]

[Effect of the Invention] Thus, in this invention, the reflection factor of printed matter is raised by the second coloring matter, the repeatability of a duplication is reduced by checking sensitization of the specific component of the reflected light, and since it is not a thing using a special color material which used the difference of human being's relative luminous efficiency and the sensitivity of a photo conductor like a Prior art, also when color material is chosen from a large range, it becomes possible to prevent forgery by the color copying machine. Moreover, when the coloring matter which has the color tone of arbitration by combining the forged prevention technology using the ink for forged prevention and the forged prevention technology in which the feature of the repeatability of a copying machine was used is used, it becomes possible to distinguish forgery using a copying machine easily also in the case of the copy by the color copying machine with high resolution. When printing printed matter in this ink for forged prevention especially and forming a printing image by the specific halftone dot or the roughness and fineness of 10,000 lines, the decolorization effect can also be added besides the aforementioned discoloration and forgery can be distinguished further still more easily. Moreover, to presenting an iris color according to an operation of the pearl pigment contained in the ink for forged prevention, since the iris color is not in a duplication, printed matter does not have a dichroic color tone, but the judgment of a duplication is easy for it. Moreover, since the specific color of an iris color can be made to emphasize by changing the thickness of metallic oxides, such as titanium oxide which has covered the mica which constitutes the pearl pigment in the ink for forged prevention, the difference between the color emphasized by the printing lifter and the color on a duplication is expanded, and the judgment of a duplication becomes still easier.

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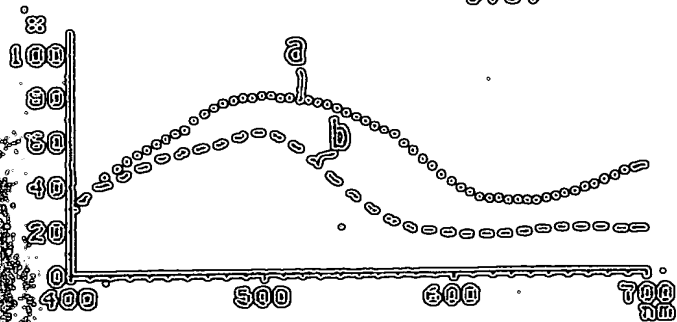
[Translation done.]

Drawing selection: drawing 1

1  
 $\theta = 10^\circ$   
 $L = 18.59$   $E = 23.58$   
 $36.64$   $23.78$   $-18.59$   $23.58$

$\theta = 10^\circ$   $\theta = 10^\circ$

$\theta = 10^\circ$   $\theta = 10^\circ$  .....  
 $\theta = 10^\circ$  .....  
 $\theta = 10^\circ$  .....



$\theta = 10^\circ$   $\theta = 10^\circ$   $\theta = 10^\circ$   $\theta = 10^\circ$   $\theta = 10^\circ$   $\theta = 10^\circ$   $\theta = 10^\circ$   $\theta = 10^\circ$   $\theta = 10^\circ$   $\theta = 10^\circ$

Load Diagram

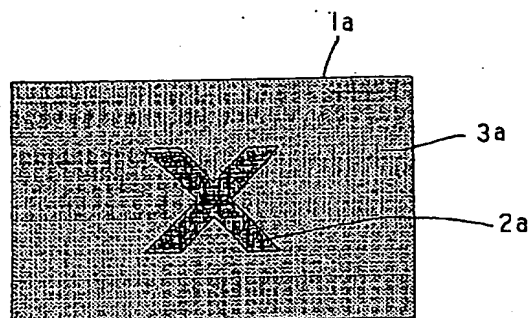


[Translation done.]

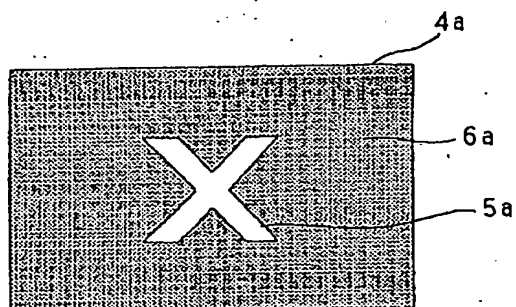
Drawing selection drawing 2



(a)

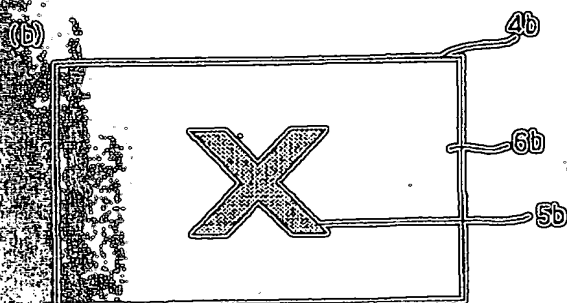
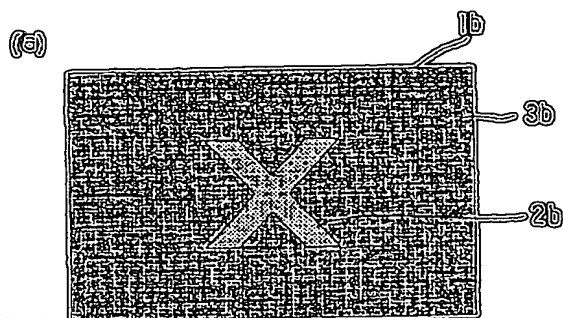


(b)



[Translation done.]

Drawing selection: drawing 3



[Translation done.]